A NEW SPECIES OF *ZAMIA* L. (ZAMIACEAE, CYCADALES) FROM CHIAPAS, MEXICO.[1]

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In the course of ongoing revisionary studies of meso-American *Zamia,* I observed a strikingly different group of plants in the research collection at Fairchild Tropical Garden. Upon further investigation of their morphology and karyotype, I concluded that these distinct plants deserved specific status.

Zamia splendens Schutzman, sp. nov.

Haec species Z. *purpurea* Vovides, Rees et Vásquez-Torres affinis sed caudici interdum ramoso, cataphyllis longis angustis et irregulariter tortilibus, petiolis foliorum aculeatis vel non aculeatis, foliolorum numeris 4-10 paribus, iunctura foliolorum ad rhachem latissima, nervis non elevatis, apicibus acutis ad abrupte acuminatis, apicibus megastrobilorum proboscideibus, microsporangiis 14-20 in quoque microsporophyllo.

Herbaceous perennial plant, 0.3-1.0m, in cultivation to 2m tall. **Stem** greyish, subterranean, occasionally dichotomously branched, varying in diameter; **cataphylls** 3-10 cm long, triangular and irregularly twisted, chartaceous, fragile and eventually deciduous. **Leaves** numbering 2-4 per apex, held in a gracefully arching crown; often emerging bright red; petiole/rachis robust, widest at its point of attachment to the caudex, degree of armament variable; prickles when present to 0.4mm in length, decreasing in frequency toward the rachis; varying from densely puberulent to glabrous; **leaflets** 8 - 20, very stiff and coriaceous, opposite to subopposite; 9-35 cm long, 3-6.5 cm wide; somewhat oblique, long-elliptic through oblong to oblanceolate, serrulate-denticulate in the apical 2/3-4/5 of their length, the teeth becoming more frequent toward the acute to abruptly acuminate apex; denticulations 0.5 to 2.5mm long; margin subrevolute; base attenuate to cuneate-attenuate, flaring out to form a 10-15mm zone of articulation with the rachis; both surfaces bright green, adaxial with an exceptionally high gloss; veins visible but not elevated, 1.5-2.5mm apart. **Megasporangiate strobili** subglobose or ellipsoid with a narrowly conic apical projection, ca. 7cm long, 4.5cm in diameter, at first light brown, tomentulose, later dark green and glabrescent; **megasporophylls** hexagonal with smooth convex surface. **Microsporangiate strobili** two or more per stem apex, conic, light brown, tomentulose, 4-5cm long and 1.1-1.3cm in diameter, declinate or decumbent on 8-14cm long peduncles; **microsporophylls** hexagonal, in regular orthostichies, with relatively smooth, dome-shaped apices upon which only a slight hexagonal outline is visible; **microsporangia** numbering 14-20 per median microsporophyll, fewer in basal and apical sporophylls. **Seeds** obovoid, to 15mm long and 7mm wide, sometimes slightly and irregularly 3-lobed, sarcotesta pink to scarlet at maturity. **Chromosome number** $2n = 16$.

TYPE: *J. Watson 1870,* specimen from cultivated plants at Fairchild Tropical Garden, accession number FTG 76-1046; collected by Mr. Merrill Rogers (Holotype: NY isotypes, FLAS, FTG, MEXU). TYPE LOCALITY: *Mexico,* CHIAPAS, 18km along the road from Mexican highway 190 to Malpaso, frequent on shaded rain forest floor with *Anthurium leuconeurum* Lem., occasionally out to the roadcut. Altitude approximately 500m.

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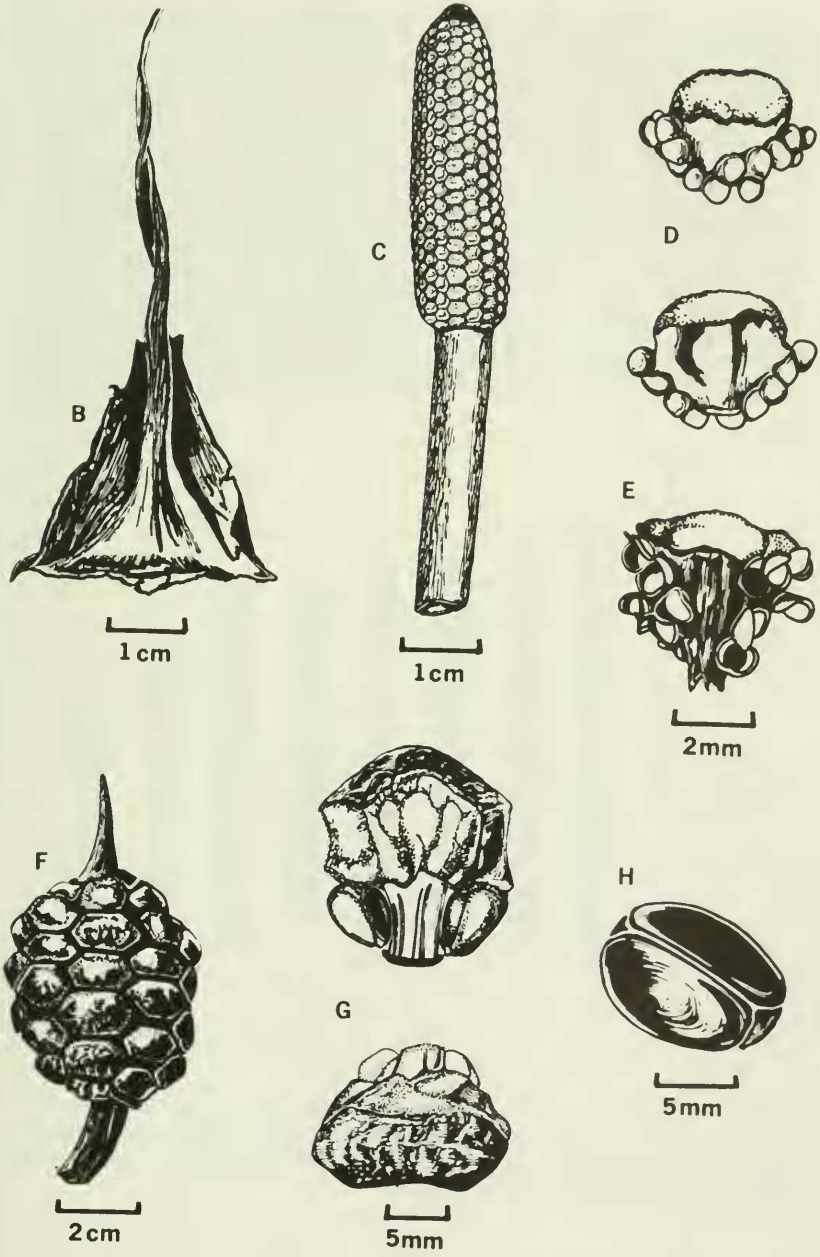
FIGURE 1. *Zamia splendens* Schutzman (Illustration of living plant at the University of Florida). A, growth habit, B, cataphyll; C, immature microsporangiate strobilus; D, immature microsporophylls, ab- and adaxial sides; E, mature microsporophyll; F, immature megasporangiate strobilus; G, immature megasporophylls, side and front view; H, seed.


B
1 cm
C
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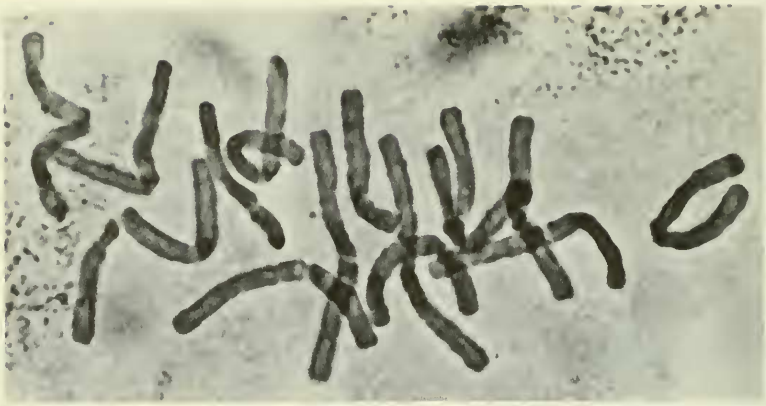

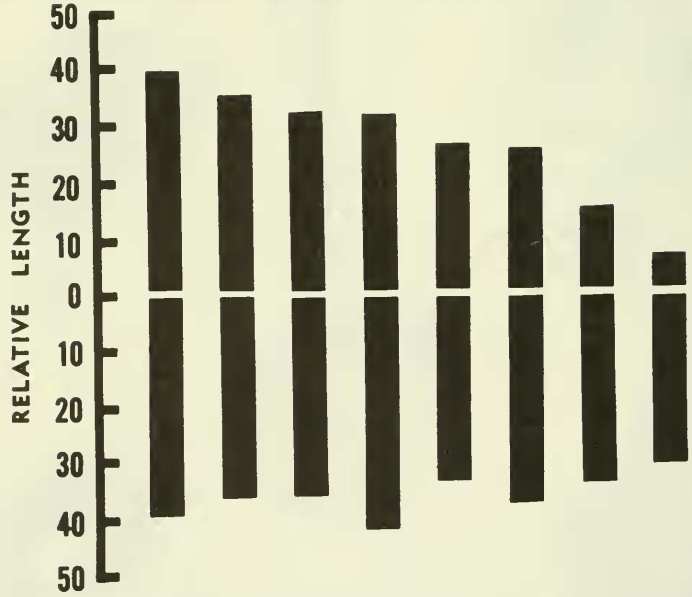

FIGURE 2. Chromosomes and haploid idiogram of *Z. splendens*. Lengths are shown in relative units. Length of the diploid complement is standardized to 1000 units; the haploid total is 500 units.

DISTRIBUTION: Known in cultivation from locations including the type locality, Cintalapa de Figueroa and Tuxtla Gutiérrez in northwestern Chiapas; and San Jerónimo Tulijá in the Lacandona forest of northeastern Chiapas. In the vicinity of Tuxtla Gutiérrez, plants were reportedly collected at an altitude of approximately 1500m.

ADDITIONAL SPECIMENS EXAMINED: San Jerónimo Tulijá, Mpio. de Yajalón, *J. Chavelas P.; G. Alanis; M. Martínez* #ES-3015 (ENCB).

Zamia splendens (FIGURE 1) is most closely affiliated with *Z. purpurea* Vovides, Rees & Vásquez-Torres and *Z. skinneri* Warsz. Distinguishing it from both are its occasionally branching stems; very long and irregularly twisted cataphylls; thick, glossy, and heavily cuticularized leaflets, which when ontogenetically adult have extremely wide zones of articulation with the rachis and lack the prominent, elevated veins of *Z. skinneri* and *Z. purpurea*; and narrow, conic, projecting apices of megasporangiate strobili.

The new species resembles *Zamia purpurea* and differs from *Z. skinneri* in its possession of a wholly underground stem, though Dressler (unpub. data) reports both subterranean and arborescent stemmed populations of *Z. skinneri*. Armament and pubescence of petiole/rachis of *Z. skinneri* and *Z. splendens* are variable. *Zamia purpurea* is reported as possessing armed petioles and initially tomentulose petiole/rachis. This taxon may prove to be more variable once further population data are gathered. On the basis of specimen annotation (D. W. Stevenson, pers. comm.), it appears that Vovides et. al have included material referable to *Z. splendens* within their concept of *Z. purpurea*.

At the type locality of *Zamia splendens*, leaf color at emergence is brilliant red, passes through salmon-pink to cream, and becomes bright green at maturity; at other localities leaves often emerge light green and merely darken to their mature bright green color. The emergent leaf color of *Z. purpurea* as stated in the original description (VOVIDES ET AL., 1983) is brown to brownish-green. Additionally, the leaflets of *Z. purpurea* are darker green above and paler beneath, whereas both surfaces of *Z. splendens* are the same shade of green, and *Z. skinneri* may exhibit either condition. Leaflet apices are acute in *Z. purpurea*, but acute to acuminate in *Z. skinneri* and *Z. splendens*. Emergent leaf color of *Z. skinneri* is usually green, though plants of reported Ecuadorean origin (T. Nance, pers. comm.) often emerge bright red, fading to pink before developing their ultimate green color.

Additional features distinguishing *Zamia splendens* may be found in its reproductive structures. Habit of microsporangiate strobili in the new species appear distinctive; the declinate or decumbent microsporangiate strobili contrast markedly with those of *Z. skinneri*, which are erect; reproductive material of *Z. purpurea* has not been seen, but the illustration in its original publication (VOVIDES ET AL., 1983) implies the same erect habit as is found in *Z. skinneri*. Shape of micro- as well as megasporophylls in both *Z. splendens* and *Z. purpurea* are convex and rounded, contrasting with the raised or otherwise pronounced hexagonal definition seen in *Z. skinneri*. In *Z. splendens*, microsporangia number between 14 and 20 per microsporophyll; this differs greatly from the reduced number (ca. 4) reported by Vovides et. al. for *Z. purpurea*. The illustration in Schuster (1932, p. 140, FIG 19F, G, K) suggests sizable variation in microsporangial number of *Z. skinneri*, but no mention is made in the text as to whether this variation was exhibited between sporophylls of the same cone, different cones on the same plant, cones of different plants, or cones from plants at different locations. He may have been referring only to the reduced number of microsporangia in apical or basal sporophylls common to many cycads (CHAMBERLAIN, 1935). Costa Rican specimens of *Z. skinneri* possess a minimum of 12 and usually more than 20 microsporangia on their median sporophylls (pers. obs.).

Zamia splendens and *Z. purpurea* stand apart from *Z. skinneri* on the basis of diploid chromosome number. *Zamia splendens* (FIGURE 2) has $2n = 16$, the same as reported by Vovides (1983) for *Z. purpurea*. Norstog (1980), however, has reported $2n = 18$ or 22 for *Z. skinneri*.

Though diploid numbers are identical, karyotype morphology may be used to distinguish *Z. splendens* from *Z. purpurea*. Vovides (1983) reported 12 metacentric and 4 acrocentric chromosomes, one of the acrocentric pairs with a heterochromatic band in the short arm. The diploid karyotype of *Z. splendens* appears to be 8 meta-, 4 submeta-, 2 acro- and 2 subtelocentric chromosomes (Figure 2 shows the haploid idiogram). Chromosomal rearrangements may be implicated in a discussion of phylogenetic relationships between the two taxa; this subject is currently under investigation.

In comparison with other Mexican taxa such as *Z. fischeri* Miq., *Z. loddigesii* Miq., and *Z. furfuracea* L.f., *Z. splendens* may be distinguished by its cataphyll morphology, emergent leaf color, leaflet size and shape, thickness, surface texture and articulation with the rachis, small mega- and microsporangiate strobili, habit of microsporangiate strobili, and shape of sporophylls. These same features, as well as the subterranean and occasionally branching nature of the stem will help distinguish it from other meso-American taxa such as *Z. acuminata* Oersted ex Dyer, *Z. fairchildeana* L.D. Gómez., *Z. obliqua* A. Braun, *Z. muricata* Willd., *Z. pseudoparasitica* Yates, and *Z. tuerckheimii* Donn. Sm.

In conclusion, the morphological and chromosomal characteristics exhibited by this group of Chiapan *Zamia* populations are adequate to identify them as belonging to a species distinct from previously described Mexican and other meso-American zamias. The specific epithet of this handsome species calls attention to its striking leaves, which have a highly polished, shining appearance.

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